

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) An optical shuffle/interconnect system, comprising:  
    an imaging system defining an input plane and an output plane, said imaging system being in the form of a gradient index rod lens;  
    means affixed to said imaging system proximate one of said planes for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane; and  
    said spatial component rearranging means comprising at least ~~one~~ two refractive or diffractive surfaces used for said rearranging of said spatial components of said object, each of said at least two surfaces being inclined with respect to said output plane and being proximate one of said planes.
2. (Canceled)
3. (Currently Amended) An optical shuffle/interconnect system, comprising:  
    an imaging system defining an input plane and an output plane, said imaging system being in the form of an optical data pipe;  
    means affixed to said imaging system proximate one of said planes for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane; and  
    said spatial component rearranging means comprising at least ~~one~~ two refractive or diffractive surfaces used for said rearranging of said spatial components of said object, each of said at least two surfaces being inclined with respect to said output plane and being proximate one of said planes.
4. (Original) The optical shuffle/interconnect system as defined in claim 1 wherein said at least one said surface is either diffractive or refractive.

5. (Original) The optical shuffle/interconnect system as defined in claim 1 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

6. (Original) The optical shuffle/interconnect system as defined in claim 4 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

7. (Currently Amended) An optical shuffle/interconnect system, comprising:

an imaging system defining an input plane and an output plane, said imaging system being in the form of a gradient index rod lens;

means incorporated into said imaging system proximate one of said planes for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane; and

said spatial component rearranging means comprising at least ~~one~~ two refractive or diffractive surfaces used for said rearranging of said spatial components of said object, each of said at least two surfaces being inclined with respect to said output plane and being proximate one of said planes.

8. (Canceled)

9. (Currently Amended) An optical shuffle/interconnect system, comprising:

an imaging system defining an input plane and an output plane, said imaging system being in the form of an optical data pipe;

means incorporated into said imaging system proximate one of said planes for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane; and

said spatial component rearranging means comprising at least ~~one~~ two refractive or diffractive surfaces used for said rearranging of said spatial components of said object, each of said at least two surfaces being inclined with respect to said output plane and being proximate one of said planes.

10. (Canceled)

11. (Original) The optical shuffle/interconnect system as defined in claim 7 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

12. (Original) The optical shuffle/interconnect system as defined in claim 11 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

13. (Currently Amended) An optical shuffle/interconnect system, comprising:

an imaging system made up of a first component and a second component, said first component and said second component being spaced apart from one another, wherein said first component and said second component of said imaging system are each in the form of a gradient index rod lens;

one said component defining an input plane and another said component defining an output plane;

means affixed to said imaging system proximate one of said planes for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane; and said spatial component rearranging means comprising at least ~~one~~two refractive or diffractive surfaces used for said rearranging of said spatial components of said object, each of said at least two surfaces being inclined with respect to said output plane and being proximate one of said planes.

14. (Canceled)

15. (Currently Amended) An optical shuffle/interconnect system, comprising:

an imaging system made up of a first component and a second component, said first component and said second component being spaced apart from one another, wherein said first component and said second component of said imaging system are in the form of an optical data pipe;

one said component defining an input plane and another said component defining an output plane;

means affixed to said imaging system proximate one of said planes for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane; and said spatial component rearranging means comprising at least ~~one~~two

refractive or diffractive surfaces used for said rearranging of said spatial components of said object, each of said at least two surfaces being inclined with respect to said output plane and being proximate one of said planes.

16. (Canceled)

17. (Original) The optical shuffle/interconnect system as defined in claim 13 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

18. (Currently Amended) The optical shuffle/interconnect system as defined in claim 15 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

19. (Canceled)

20. (Previously Presented) The optical shuffle/interconnect system as defined in claim 3 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

21. (Canceled)

22. (Previously Presented) The optical shuffle/interconnect system as defined in claim 9 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

23. (Canceled)